

## REMARKS

Claims 26-45 are pending. Claims 1-17 have been cancelled and new Claims 26-45 drafted for ease of examination. Support for new Claims 26-45 derives from the specification and claims as originally filed. For example, Figures 1, 2, and the specification at page 16, line 26 through page 17, line 6 describe an automated protein design apparatus comprising a central processing unit that communicates with memory and a set of input/out devices. Support for the steps comprising the HERO search can be found in FIGS. 3B, 3C, 3D and throughout the specification, see for example page 7, line 15, through page 15, line 36. Because the foregoing amendments introduce no new matter, Applicants respectfully request their entry.

### **Non-statutory subject matter**

Claims 1-4, 6-8, and 13-15 are rejected under 35 U.S.C. § 101 because the claimed invention is allegedly directed to non-statutory subject matter. The rejection is moot as applied to claims 1-4, 6-8, and 13-15. Applicants respectfully submit that this rejection does not apply to newly added Claims 26-45 for the following reasons.

Applicant respectfully draws the Examiner's attention to *In re Alappat*, 31 USPQ2d 1545 (CA FC 1994). In this case, an Applicant presented a claim to a rasterizer, containing various claim limitations recited in a "means for" format. The court concluded that the means-plus-function claim, when properly construed claimed a rasterizer "made up of, at the very least, the specific structures disclosed in Alappat's specification corresponding to the means-plus-function elements (a)-(d) recited in the claim." Further, the court stated that, "because claim 15 is directed to a 'machine', which is one of the four categories of patentable subject matter enumerated in section 101, claim 15 appears on its face to be directed to Section 101 subject matter". See *In re Alappat*, 1555.

Alappat's claim 15 had been rejected, stating that it was directed to mathematical subject matter. The Court stated that "the proper inquiry in dealing with the so called mathematical subject matter exception to Section 101 alleged herein is to see whether the claimed subject matter *as a whole* is a disembodied mathematical concept, whether categorized as a mathematical formula, mathematical equation, mathematical algorithm, or the like, which in essence represents nothing more than a 'law of nature,' 'natural phenomenon,' or 'abstract idea'. *See In re Alappat*, 1557, emphasis in original. The Court found that "Although many, or arguably even all, of the means elements recited in claim 15 represent circuitry elements that perform mathematical calculations, which is essentially true of all digital electrical circuits, the claimed invention as a whole is directed to a combination of interrelated elements which combine to form a machine for converting discrete waveform data samples into anti-aliased pixel illumination intensity data to be displayed on a display means. This is not a disembodied mathematical concept which may be characterized as an 'abstract idea', but rather a specific machine to produce a useful, concrete, and tangible result." *See In re Alappat*, 1557.

In the present application, Applicants submit that independent claims 33 and 40 are directed toward an apparatus, i.e., a microprocessor, for producing a useful, concrete, and tangible result. Accordingly, Applicants submit that independent claims 33 and 40, and dependent claims 34-39 and 41-42 contain statutory subject matter.

In addition, Applicants wish to draw the Examiner's attention to *In re Beauregard*, 35 USPQ2d 1383 (CA FC 1995) holding that computer programs embodied in tangible medium, such as floppy diskettes are patentable subject matter under 35 U.S.C. § 101.

In the present application, Applicants submit that independent claims 26 and 43 are directed towards computer programs embodied in a tangible medium. Accordingly, Applicants

submit that independent claims 26 and 43 and dependent claims 27-32 and 44-45 contain statutory subject matter.

Applicants respectfully submit that the rejection under 35 U.S.C. §101 is improper, and should be withdrawn.

### **Rejection under 112**

Claims 1-8 and 13-17 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The Examiner states that the metes and bounds of HERO are not defined. The rejection is moot as applied to cancelled claims 1-8 and 13-17. Applicants respectfully submit that this rejection does not apply to newly added Claims 26-45, as the new claims recite the metes and bounds of the HERO computation.

In addition, the Examiner states that it is not clear what is meant by the use of the word “optimized”. Applicants respectfully direct the Examiner’s attention to the page 36, lines 25-26, which sets forth the definition of “optimized protein sequences”. Accordingly, Applicants submit that further clarification as to what is meant by the “optimized” is not necessary.

Withdrawal of the rejection of claims 1-8 and 13-17 under 35 U.S.C. § 112, second paragraph is requested.

### **Rejection under 102(b)**

Claims 1-4, 6, and 13-15 are rejected under 35 U.S.C. § 102(b) as being allegedly anticipated by Pierce *et al.*, 2000, J. Comput. Chem., 21(11): 999-1009. The rejection is moot as applied to cancelled claims 1-4, 6, and 13-15. Applicants respectfully submit that this rejection does not apply to newly added Claims 26-45 for the reasons stated below.

To anticipate a claim under 35 U.S.C. § 102(b), a reference must teach every element of the rejected claim (MPEP § 2131). Pierce et al describe a HERO computation that uses simple split DEE, wherein  $s > 1$ , to split conformational space into two partitions, corresponding to

splitting rotamers  $k_{v1}$  and  $k_{v2}$  (*see* Figure 2(e)). In contrast, the new claims teach a HERO computation using split flags. Pierce et al do not teach or suggest the use of split flags. Hence, Pierce *et al.* does not anticipate the claimed subject matter. Withdrawal of the rejection of 1-4, 6, and 13-15 under 35 U.S.C. § 102(b) is requested.

Please direct any calls in connection with this application to the undersigned at (415) 781-1989.

Respectfully submitted,  
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